LAB REPORT

By Norman Goldberg

KIRON 35→135-mm f/3.5-4.5

Field Check

This handsomely finished lens spans a zoom ratio of just under 4X, covering focal lengths from 35-mm to 135-mm. This range is just about all I need for casual shooting. In addition, a "macro"-focusing range permits close-ups to 1/4 life-size magnification.

The main control collar of this one-touch zoom is covered with a finely checkered rubber sleeve. One pushes or pulls the collar to zoom, and twists it to focus. The normal close-focus limit of about 50 in. is fine for portraits made at the 135-mm setting.

To get closer, you first pull the control collar all the way back to the 35-mm setting, then twist it to the infinity stop. Close focusing is then done with the "macro" control ring, which is provided with click stops at each of three reproduction ratio settings: 1:6, 1:5, and 1:4. (This is not quite enough to be "true" macro.)

35-mm

Kiron recommends that you select one of the three settings, then focus by moving toward or away from the subject. I tried this method, as well as changing the focus and zoom settings. The manufacturer's recommendation produced the best results—for close-focusing work with this lens, it should be set at its infinity and 35-mm marks.

The third control is the diaphragm-setting ring, which carries fine, straight knurling on its surface. This helps distinguish it from the macro-setting ring, whose surface carries a broad, shallow, straight knurling. There's no problem telling which ring is which, simply by tactile clues. All controls worked effortlessly, even while I was wearing gloves.

After making a series of test shots outdoors, I tried some indoor close-ups, with the camera mounted on a copy stand. This proved to be awkward, because the smooth-working zoom/focus collar that I appreciated so much outdoors would creep off its 35-mm focal-length setting. It continued to slide toward the 135-mm setting as long as it was pointed down. Tiring of holding the zoom/focus collar with one hand as I shot, I resorted to a short piece of tape to trap the setting.

This difficulty is shared by nearly all one-touch zooms, and to Kiron's credit, some of their models feature a switch that locks the zoom control at the chosen focal length. Unfortunately, this lens isn't so equipped.

Another common shortcoming of compact zooms is the ambiguity of the f-stop settings. Like most of its counterparts, this Kiron lens' aperture settings shift down about one full f-stop as the focal length is changed from its shortest to longest position. The problem is in the way this shifting f-stop is indicated on the lens' aperture-selection ring.

This zoom uses two "witness marks," in the form of red dots labeled "T" and "W" for telephoto and wide-angle, respectively. The idea is to set the f-stop you want opposite the dot that's appropriate for the focal length you've chosen. The trouble is, the dots are very close together—too close to try setting an f-stop between them for some intermediate focal length.

Also, the ring has click stops at each full f-stop, but only at two half-stop settings. This discouraged me from trying to make exact settings for flash shots and close-up work. Choosing the safe alternative, I bracketed my exposures.

Most problems caused by this f-stop ambiguity should be minimized by the auto-exposure systems in modern cameras and flash units, not to mention the forgiveness built into popular color-negative films. What counts in the end is the image, and this lens produced some very nice-looking photographs for me.

I used the Kiron 35→135-mm lens on a Pentax LX, and can report that it coupled properly with the camera's exposure-control system which, when set on automatic, makes its exposure determinations from the light reaching the film. This eliminated any problems from the uncertain f-stops mentioned above. ✪

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Macro

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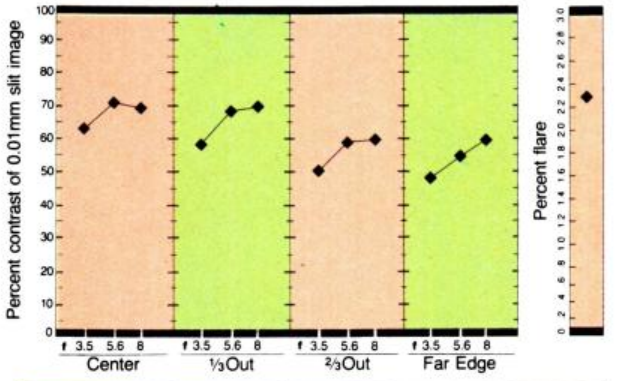
Lens Performance

Kiron 35→135-mm f/3.5-4.5 **Ser. No. 26204439**

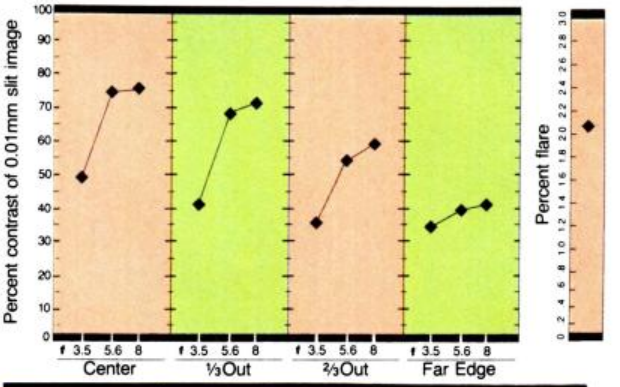
Dimensions: O.D. 65.8 mm (2.59 in.) **L.** 115 mm (4.53 in.) **Weight:** 694 g (24.3 oz.) **Filter size:** 62-mm

35-mm (shortest)
Close working limit: 1,252 mm (49.29 in.)
Close limit field size: 815x1,225 mm (32.09x48.23 in.)
Focal length: Marked: 35-mm **Measured:** 34.24-mm
f-number: Marked: f/3.5 **Measured:** f/3.11 **T-number:** T-3.67



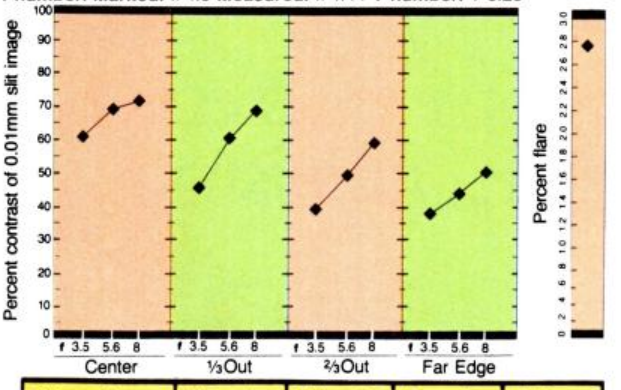
Aberration	1/3 out	2/3 out	Far-edge	Notes
Coma	4.5	5.6	6.3	Critical f-stops
Astigmatism	3.5	3.5	3.5	
Lat. chrom.	V. slight	Moderate	Moderate	
Long. chrom.	blue-green-red = 0.04 mm			Focus shift
Spherical	f/3.5–f/8 = +0.12 mm			
Distortion	Very slight pincushion			
Vignetting	None beyond f/6.3			
Centering	Near-perfect			

80-mm (medium)
Close working limit: 1,252 mm (49.29 in.)
Close limit field size: 357x528 mm (14.06x20.79 in.)
Focal length: Marked: 80-mm **Measured:** 81.2-mm
f-number: Marked: f/4 **Measured:** f/4.06 **T-number:** T-4.78



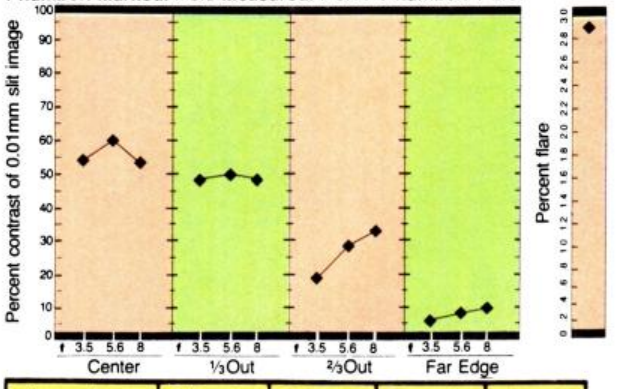
Aberration	1/3 out	2/3 out	Far-edge	Notes
Coma	3.5	4.5	5.6	Critical f-stops
Astigmatism	3.5	3.5	3.5	
Lat. chrom.	None	Slight	Moderate	
Long. chrom.	blue-green-red = 0.06 mm			Focus shift
Spherical	f/3.5–f/8 = 0.00 mm			
Distortion	Moderate pincushion			
Vignetting	None beyond f/5.6			
Centering	Slightly off			

135-mm (longest)
Close working limit: 1,252 mm (49.29 in.)
Close limit field size: 214x317 mm (8.43x12.48 in.)
Focal length: Marked: 135-mm **Measured:** 133.2-mm
f-number: Marked: f/4.5 **Measured:** f/4.44 **T-number:** T-5.23



Aberration	1/3 out	2/3 out	Far-edge	Notes
Coma	5.6	6.3	6.3	Critical f-stops
Astigmatism	3.5	3.5	3.5	
Lat. chrom.	None	None	None	
Long. chrom.	blue-green-red = 0.09 mm			Focus shift
Spherical	f/3.5–f/8 = −0.15 mm			
Distortion	Moderate pincushion			
Vignetting	None beyond f/5.6			
Centering	Slightly off			

Macro
Close working limit: 120 mm (4.72 in.)
Close limit field size: 94x143 mm (3.70x5.63 in.)
Focal length: Marked: 35-mm **Measured:** 34.24-mm
f-number: Marked: f/3.5 **Measured:** f/3.11 **T-number:** T-3.67



Aberration	1/3 out	2/3 out	Far-edge	Notes
Coma	5.6	6.3	9	Critical f-stops
Astigmatism	3.5	8	16	
Lat. chrom.	V. slight	Pron.	Pronounced	
Long. chrom.	blue-green-red = 0.04 mm			Focus shift
Spherical	f/3.5–f/8 = +0.20 mm			
Distortion	Very slight barrel			
Vignetting	None beyond f/6.3			
Centering	Near-perfect			

Mechanical: Inside as well as outside, this lens is impressively well-machined. Its zoom mechanism uses four nested aluminum sleeves, apparently lapped together for a superb fit.

Using a 15-element, 11-group optical construction, the lens is divided into four sections. The front section rotates and moves forward during focusing. */continued on page 101*

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The second section remains fixed as the other three all move during zooming.

This action involves nonlinear motion of the third and fourth sections, but there's no hint of this from the feel of the control collar; the required force seems to be constant over the entire zoom range. This can be attributed to the carefully fitted parts, the low-friction plastic cam-followers, and the sparing use of the proper grease. During the shift to "macro" focusing, the entire lens assembly is shifted forward as a unit, as if an adjustable extension tube were being added to the rear.

The version of the lens tested was in the P/K (Pentax K) mount. The mount itself is chrome-plated brass, solidly anchored to the barrel with five screws. The auto-diaphragm mechanism employs a ball-bearing suspension, and is simple and strong. While the internal baffling appears well done, some bright element edges in the rear sections seemed to contribute to the flare levels.

LENS TEST GLOSSARY

(See Lab Report on page 32)

Aberrations: A flawlessly manufactured lens may still exhibit residual aberrations (image faults). Often, certain aberrations are permitted by the designer to minimize others felt to be more harmful to image quality.

Astigmatism: Causes lines radial to the optical axis, and lines perpendicular to these, to focus in two different planes. Improved by stopping down.

Centering: The center of curvature of each lens surface should lie on a common line.

Coma: Comet- or tear-drop-shaped images of off-axis points of light. Improved by stopping down.

Contrast test: Contrast levels are compared electronically between the image of a coarse and fine slit, and the result is expressed as a percentage.

Critical f-stop: The largest opening at which the aberration being examined is considered to be under satisfactory control.

Distortion: Causes image of window frame (for example) to bow out (barrel type) or in (pincushion type), but does not influence sharpness. Not improved by stopping down.

Flare: Causes an overall loss in contrast. Sometimes called "veiling glare."

Flare test: The lens is presented to a target consisting of a totally black spot surrounded by a uniformly bright field of infinite dimension. The amount of light nergy present in the center of the image of the black spot is measured and expressed as a percentage of the light energy in the image of the bright surround.

Lateral chromatic aberration: A variation of magnification with color. Not improved by stopping down.

Longitudinal chromatic aberrations: A shift of focus with color. Not improved by stopping down.

Spherical aberration: Causes a focus shift as the lens is stopped down.

T-number: The actual maximum f-number divided by the square-root of the percentage of transmitted light.

Vignetting: Causes underexposure at the corners of the film. Improved by stopping down.

Misc. terms and practices: *Close working limits* are measured from the target to the foremost portion of the lens when it is set to its closest focusing position. The *close-limit field size* is measured at this point. The portions of the image field examined during both the contrast and star tests are the center, 1/3 out, 2/3 out, and far edge for rectangular formats and correspond to the following positions within the 24 × 35-mm format of a 35-mm camera's image; the center, 6 mm off-center, 12 mm off-center, and 18 mm off-center. Square formats are examined at the center, halfway to the edge, at the edge, and at the corner.